

***Nemcia effusa* (Fabaceae: Mirbelieae), a new species from south-west Western Australia, and a key to *Nemcia***

M.D. Crisp<sup>1</sup> and F.H. Mollemans<sup>2</sup>

<sup>1</sup>Division of Botany and Zoology, The Australian National University, Canberra, Australian Capital Territory 0200  
<sup>2</sup>76-6228 Plumeria Road, Kailua-Kona, Hawaii 96740 USA  
[Current address: PO Box 734, Victoria Park, Western Australia 6100]

**Abstract**

Crisp, M.D. and Mollemans, F.H. *Nemcia effusa* (Fabaceae: Mirbelieae), a new species from south-west Western Australia, and a key to *Nemcia*. Nuytsia 9 (2): 223-232 (1993). A new species of *Nemcia*, *N. effusa* Crisp & Mollemans, is described from the north-west part of Lake Grace shire, south-west Western Australia. The species is quite distinct with no clear affinities. It is named for its habit with rigid, diffuse stems and branchlets. In some respects similar to *N. stipularis* (Meissner) Crisp, it differs in the leaves spreading widely and being broader (3-4 mm) and impressed-punctate below, and with stipules shorter (2-3 mm). It is also similar to *N. punctata* (Turcz.) Crisp in the leaves being impressed-punctate below, but differing in having conspicuous stipules and longer leaves (1-2.5 cm) that are spreading widely but scarcely recurved. Only two plants of *N. effusa* were found at the type locality, and the species was not observed elsewhere during surveys of remnant vegetation (by the second author) of c. 71,250 km<sup>2</sup> of the southern wheatbelt region of Western Australia. This suggests that *N. effusa* is neither widespread nor common.

**Introduction**

During the latter half of 1992, surveys of remnant vegetation were being carried out by the second author in the southern wheatbelt region of Western Australia, a total of c. 71,250 km<sup>2</sup> having been surveyed during 1991 and 1992. Late in the day on the 26th of August the second author was travelling along a road in the north-west corner of Lake Grace Shire, when the abundant growth of yellow, flowering specimens of *Asterolasia squamuligera* (Hook.) Benth. (a significant range extension - Paul G. Wilson, pers. comm.) caused a stop for collections and photographs. In the course of carrying out this work a *Nemcia* was observed, a collection made and photographs taken. Further research has since indicated that this *Nemcia* is a distinct, previously undescribed taxon. The new species is described here.

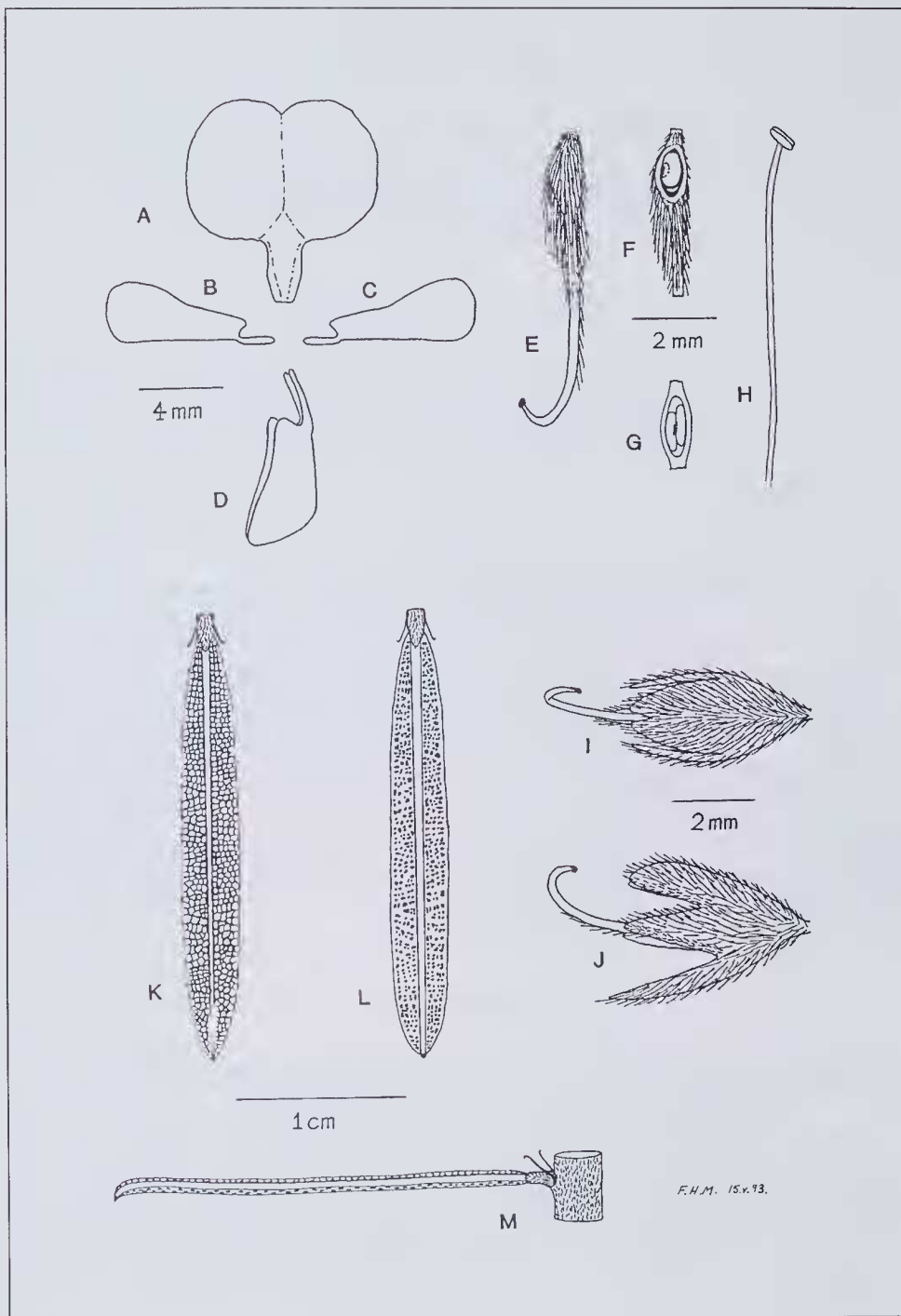


Figure 1. *Nemcia effusa*. A - standard; B, C - wings; D - keel; E - gynoeceium; F - sectioned ovary showing ovules; G - adaxial view of sectioned ovary showing ovule arrangement; H - stamen, lateral view; I - calyx, adaxial view; J - calyx, lateral view; K - leaf, adaxial view; L - leaf, abaxial view; M - leaf, lateral view with stipules and section of branchlet. Drawn from the type.

## Taxonomy

### *Nemcia* Domin

#### *Nemcia effusa* Crisp & Mollemans, sp. nov. (Figures 1-3)

Species propria caulibus ramulisque rigidis diffusus; *N. stipulari* (Meissner) Crisp similis sed foliis patentibus latioribus (3-4 mm latis) subtus impresso-punctata stipulis brevioribus (2-3 mm longis) differt; *N. punctatae* (Turcz.) Crisp similis foliis subtus impresso-punctatis sed stipulis conspicuis foliis longioribus (1-2.5 cm longis) patentibus autem vix recurvis differt.

A distinctive species with rigid, diffuse stems and branchlets. Similar to *N. stipularis* (Meissner) Crisp but differing in the leaves spreading widely and being broader (3-4 mm) and impressed-punctate below, and with stipules shorter (2-3 mm). Similar to *N. punctata* (Turcz.) Crisp in the leaves being impressed-punctate below, but differing in having conspicuous stipules and longer leaves (1-2.5 cm) that are spreading widely but scarcely recurved.

*Typus*: Western Australia: Wheatbelt (SE); Lake Grace Shire; SE of Kukerin [precise locality withheld], 26 August 1992, F.H. Mollemans 4260 (holo: PERTH; iso: CBG). (Figure 1)



Figure 2. Habit of *Nemcia effusa* in mallee over mixed scrub 1-1.2 m high on gravelly soil in the north-west corner of Lake Grace Shire. (Photo: F.H. Mollemans).

Diffuse, open, spreading, straggling *shrubs* to c. 1 m tall and across. *Stems* and *branchlets* rigid, diffuse, grey-velutinous. *Leaves* widely spreading, ternate, simple, entire, narrowly oblong-elliptic, rigid, gently sigmoid, scarcely recurved at apex, mucronate, 1-2.5 cm long, 3-4 mm wide, glabrous; *mid-nerve* shallowly impressed above, thickened and prominent below; venation densely reticulate, very thick below with areoles impressed-punctate; *petiole* c. 2 mm long, grey-velutinous; *stipules* conspicuous, filiform, 2-3 mm long. *Flowers* 2-6 in very condensed, fascicle-like axillary racemes, subsessile on pedicels to 0.5 mm long, 10 mm long; *bracts* caducous, trifid, grey-sericeous, c. 4 mm long. *Calyx* 4-5 mm long, white-villous; lobes triangular, upper two united for 7/8 of length, broadly acute, lower three acute; *standard* strongly exerted from calyx, transversely broad-elliptic, retuse, 6 mm long (excluding 3.5 mm claw), 9 mm wide, adaxially apricot-coloured with red-maroon markings towards centre, abaxially red-maroon; *wings* obovate, 8 mm long, apricot-coloured in distal half, otherwise red-maroon; *keel* longitudinally half broad-obovate, 8 mm long, red-maroon. *Stamens* free, 8 mm long; *ovary* 2 mm long, shortly pubescent at base, otherwise covered with antrorse silky hairs to 2 mm long; *ovules* 2. *Pod* not seen.

*Distribution.* Endemic to the Stirling Botanical District of south-west Western Australia, with one known locality in the north-west corner of Lake Grace Shire. (Figure 3)

*Habitat.* Grows in mallee over mixed scrub 1-1.2 m high on gravelly soil. Vegetation is typical (for the region), diverse natural scrub with mixed species composition including *Dryandra* spp., *Allocasuarina humilis* (Otto & Dietr.) L. Johnson, *Lambertia*, *Daviesia*, and *Leptospermum*.

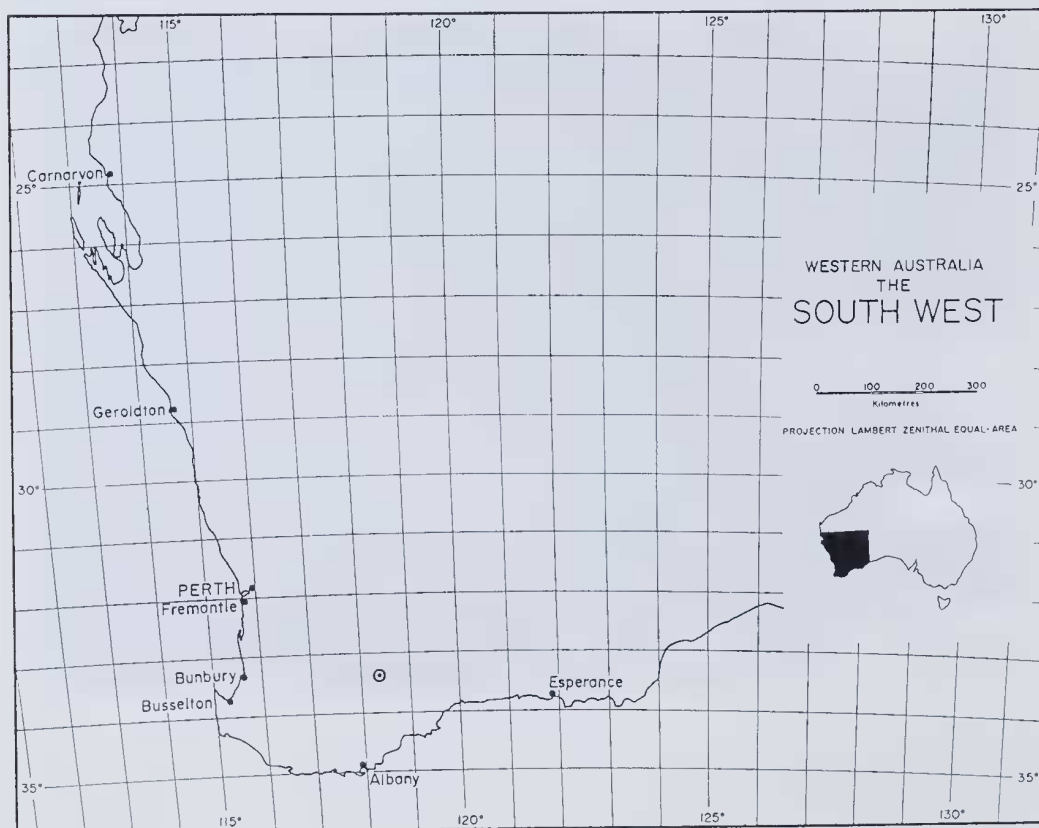


Figure 3. Distribution of *Nemcia effusa*.

*Flowering period.* Plants were in full flower in late August 1992. That year was, however, an exceptional one in which flowering of many wheatbelt taxa was delayed for up to 4 weeks by an extended, cold, wet winter. Under the circumstances, it is considered that the flowering period for *N. effusa* in an average season would be July-August.

*Conservation status.* Poorly known, CALM Priority 1. Only two plants of *N. effusa* were observed at the type locality, and the species has not been observed elsewhere during surveys of remnant vegetation (by the second author) of c. 71,250 km<sup>2</sup> of the southern wheatbelt region of Western Australia. This suggests that *N. effusa* is not widespread or common.

*Etymology.* The specific epithet *effusa*, from Latin, means straggling or spreading, and refers to the growth habit of this species.

*Affinity.* *Nemcia* is an endemic genus in south-west Western Australia with c. 40 known species, ten of which are undescribed. One, *N. lehmannii*, is presumed extinct, and several others, including *N. effusa*, are very restricted in distribution. The following key includes all known species, the undescribed ones being referred to by a specimen number.

The present circumscription of *Nemcia* was defined by Crisp & Weston (1987), who resurrected the genus from synonymy and expanded it to include species of *Gastrolobium* with obviously trifid bracts, no fluoro-acetate, erect calyx-lobes and condensed inflorescences. Members of the latter group all have two ovules, whereas in its original circumscription, *Nemcia* was characterised by more than two ovules (Domin 1923). *Nemcia* is now diagnosed by its distinctive inflorescence which is a condensed raceme (often head-like or cluster-like) with a short stout rachis and few flowers (generally <10). The bracts are distinctive too, being obviously trifid, silky, caducous, and often enclosing the inflorescence in a globular bud. *Nemcia* is closely related to *Brachysema* and *Jansonia*. Both differ in having large, red and/or green bird-pollinated flowers, and *Brachysema* has more openly racemose inflorescences. However, a recent cladistic analysis by Crisp (in press) has indicated that *Jansonia* and *Nemcia* may be congeneric. Both have the same type of inflorescence, and some species of *Nemcia* have large red bird-pollinated flowers, viz. *N. leakeana*, *N. rubra* and *N. vestita*, albeit with different floral morphology from *Jansonia*. If these genera are combined, then the name *Jansonia* has priority. The first author is carrying out molecular studies in an attempt to resolve the relationship of these genera; meanwhile it seems sensible to maintain their distinction. A key to all the genera of the tribe Mirbelieae, including *Nemcia*, is provided by Crisp & Taylor (1993).

No attempt has been made to resolve relationships within *Nemcia*, and no infrageneric classification exists. *Nemcia effusa* belongs to the group with two ovules, yet is very distinctive. It shows some similarity to *N. stipularis* by virtue of the conspicuous stipules and narrow leaves, but the latter differs in having erect, linear (c. 2 mm wide) leaves with craspedodromous venation which lacks deeply impressed areoles beneath, and the stipules are longer (up to 12 mm). *Nemcia punctata* also is similar, especially in having impressed-punctate leaf venation below, but its leaves are much shorter (c. 5 mm long) and more strongly recurved, and there are no stipules.



Key to *Nemcia* species

- 1 Flowers large (calyx >8 mm long); petals predominantly red (bird-pollinated group) ..... 2
- 2 Expanded leaves velvety beneath, with recurved margins ..... *N. vestita* Domin
- 2\* Expanded leaves glabrate beneath, never velvety; margins not or scarcely recurved ..... 3
- 3 Calyx villous, tube ventricose at base; wing- and keel-petals ovate; leaves narrowly oblong-elliptic, scarcely emarginate ..... *N. rubra* Crisp
- 3\* Calyx sericeous, tube not ventricose; wing- and keel-petals elliptic; leaves elliptic to broad-elliptic, emarginate to obovate ..... *N. leakeana* (Drumm.) Crisp
- 1\* Flowers smaller (calyx <8 mm long); petals predominantly yellow or orange with dark red markings ..... 4
- 4 Leaves all alternate, scattered, ovate; flowers 1-3 per axil; calyx 7-8 mm long ..... *N. sp.* [Crisp 6727]
- 4\* Leaves opposite (a few may be alternate), whorled or very crowded, variously shaped; flowers usually >3 per axillary unit inflorescence; calyx usually <7 mm long ..... 5
- 5 Stipules absent or minute ..... 6
- 6 Leaves spreading from the base, 10-15 mm long; apex with a long pungent point ..... *N. epacridoides* (Meissner) Crisp
- 6\* Leaves very crowded, appressed (at least at the base), imbricate, <7 mm long ..... 7
- 7 Leaves opposite and decussate ..... *N. sp.* [Crisp 6496]
- 7\* Leaves ternate (in whorls of three) ..... 8
- 8 Venation of lower leaf surface very thick, with areoles reduced to pin-pricks; leaves broadest towards the base ..... *N. punctata* (Turcz.) Crisp
- 8\* Venation of lower leaf surface openly reticulate; leaves broadest near or slightly below the middle ..... *N. carinata* Crisp
- 5\* Stipules present, setaceous or filiform, usually conspicuous ..... 9
- 9 Calyx indumentum two-toned: at least partly golden or rust-coloured; with silver hairs present also, especially towards base of calyx ..... 10
- 10 Leaves cuneate or obovate, or narrowly so ..... 11
- 11 Leaves with margins recurved, especially towards the bilobed apex; upper surface darker than lower, rugose with obscure venation; lower surface silver- or grey-sericeous and scarcely glabrescent ..... *N. emarginata* (S. Moore) Crisp
- 11\* Leaf margins not recurved, sometimes undulate or crisped; surfaces similar in colour, glabrous or soon glabrescent; venation conspicuous, finely reticulate ..... 12
- 12 Leaves obovate, trilobed; middle lobe equal to or longer than lateral lobes ..... *N. sp.* [*Oxylobium dilatatum* Benth. var. *trilobum* Meissner]

- 12\*Leaves obovate or cuneate, usually narrow, never  
obtrullate; apex variable, rarely sub-trilobed and if so,  
middle lobe much shorter than lateral lobes ..... 13
- 13 Leaf margins crisped ..... *N. sp.* [Patrick 458] 14
- 13\*Leaf margins not crisped ..... 14
- 14 Leaves 30-50 x 10-20 mm; margins evenly tapered to  
the base; apex very variable: emarginate, bilobed,  
trilobed, rounded, obtuse or acuminate ..... *N. dilatata* (Benth.) Crisp
- 14\*Leaves 5-40 x 3-11 mm, mostly <25 x 8 mm;  
rounded at base; apex strictly emarginate ..... *N. retusa* (Lindley) Domin
- 10\*Leaves orbicular, ovate, elliptic, oblong, or narrowly so ..... 15
- 15 Inflorescences, young stems and sometimes young  
leaves densely hirsute with rust-coloured hairs ..... *N. pyramidalis* (T. Moore) Crisp
- 15\*Inflorescences and young stems sericeous to villous,  
usually silvery ..... 16
- 16 Leaves silvery sericeous below, very tardily glabrescent ..... 17
- 17 Leaf-margins strongly recurved to revolute; flowers  
4-6 per unit-inflorescence; leaves narrowly  
oblong-elliptic ..... *N. sp.* [Keighery, PERTH 01041126]
- 17\*Leaf-margins not or slightly recurved; flowers  
8-many per unit-inflorescence; leaf shape very  
variable: orbicular, ovate, oblong, elliptic, or  
narrowly so ..... *N. coriacea* (Smith) Domin
- 16\*Leaves glabrate below ..... 18
- 18 Unit-inflorescences forming dense clusters in  
leaf-axils, or on very short (1-2 mm) peduncles;  
leaves narrow-oblong to -cuneate ..... *N. retusa* (Lindley) Domin
- 18\*Axillary unit-inflorescences head-like on distinct  
peduncles 5-15 mm long; leaves obovate-oblong,  
usually broad ..... *N. crenulata* (Turcz.) Crisp
- 9\* Calyx indumentum uniform in colour: usually silver,  
sometimes buff-coloured ..... 19
- 19 Leaves with 3 or more prickly lobes or teeth ..... 20
- 20 At least some leaves per specimen with >3 prickly  
lobes or teeth; leaf margins recurved; lamina tending  
to undulate between depressed main veins ..... *N. ilicifolia* (Meissner) Crisp
- 20\*All leaves with 3 pungent apices; leaf margins not  
recurved; lamina somewhat plicate (folded up  
lengthwise) but otherwise flat ..... *N. tricuspoidata* (Meissner) Crisp
- 19\*Leaves either entire or with not more than 1 pungent apex ..... 21
- 21 Leaves crowded, linear, 1-2 mm broad; stipules  
5-10 mm long ..... *N. stipularis* (Meissner) Crisp
- 21\*Leaves scarcely or not crowded, >2 mm broad;  
stipules <5 mm long ..... 22

- 22 Leaves pungent, usually tapered to base; standard  
<12 mm broad; ovules 2 ..... 23
- 23 Leaves in whorls of 3 or 4, broadest at or below middle,  
tapered to apex ..... *N. acuta* (Benth.) Domin
- 23\*Leaves decussate or ternate (rarely some scattered),  
broadest at or above middle, tapered to base  
(in *N. obovata*, tapered to apex as well) ..... 24
- 24 Leaves bluish, cuneate, more or less truncate at apex ..... *N. sp.*
- 24\*Leaves sometimes glaucous but never bluish, variously shaped ..... 25
- 25 Leaves obtrullate or rhombic, plicate;  
flowers per axillary unit-inflorescence 6 or more ..... *N. obovata* (Benth.) Crisp
- 25\*Leaves obovate, spatulate or linear, usually  
plicate but occasionally nearly flat; flowers per  
unit-inflorescence 1-4 ..... 26
- 26 Leaves yellow-green, not glaucous, strongly plicate,  
falcate overall and hooked at apex; accessory  
shoots in axils ..... *N. sp.* [*Cranfield* 4538; may in fact be *plicata*]
- 26\*Leaves more or less glaucous, strongly to  
scarcely plicate, straight or scarcely falcate  
and with the apex at most slightly recurved;  
accessory shoots lacking ..... 27
- 27 Calyx 4.5-7 mm long, sericeous to villous or  
tomentose; leaves obovate or spatulate,  
often narrow, sometimes nearly flat;  
broadest part of leaf 3-9 mm from midrib  
to margin ..... *N. plicata* (Turcz.) Crisp [syn. *N. pauciflora* (C. Gardner) Crisp]
- 27\*Calyx 3.8-4.2 mm long, more or less  
sericeous; leaves linear, strongly plicate;  
broadest part of leaf 1.9-4.1 mm from  
midrib to margin ..... *N. sp.* [*Groves*, PERTH 01052160]
- 22\*Leaves not pungent, or if tending to be so,  
then leaves rounded at base (*N. hookeri*) or  
ovules >3 and standard 14-15 mm broad (*N. reticulata*) ..... 28
- 28 Branchlets angular with yellow ribs; leaves as  
broad as long or broader, rounded-cuneate  
or -rhombic, orbicular or ovate ..... *N. sp.* [*Braine*, PERTH 01052683]
- 28\*Branchlets terete, or if angular, then lacking  
distinct yellow ribs; leaves longer than broad,  
variously shaped ..... 29
- 29 Venation of lower leaf surface very thick, with  
areoles reduced to pin-pricks ..... *N. effusa* Crisp & Mollemans
- 29\*Venation of lower leaf surface openly reticulate ..... 30
- 30 Ovules 4 or more; calyx >5 mm long ..... 31
- 31 Standard 14-15 mm broad; indumentum  
tomentose (to villous); leaves glabrate; leaves  
basically obovate, broad to linear ..... *N. reticulata* (Meissner) Domin



- 31\*Standard 10-12 mm broad; indumentum sericeous or calyces tending to be villous; leaves more or less persistently sericeous beneath; leaves basically ovate to elliptic (rarely obovate), broad to linear ..... 32
- 32 Nodes per axillary unit-inflorescence 2, buds 4 (terminal inflorescences may have more nodes and buds); calyces sericeous; leaves narrow to linear ..... *N. capitata* (Benth.) Domin
- 32\*Nodes per axillary unit-inflorescence 3(4), buds 6(8); calyces villous; leaves usually broad, rarely narrow ..... *N. axillaris* (Meissner) Crisp
- 30\*Ovules 2; calyx not >5 mm long ..... 33
- 33 Leaves neither plicate nor with apices recurved; outlines oblong-elliptic (or tending to ovate, obovate, orbicular or slightly cuneate); apices rounded or truncate, usually retuse, never pungent ..... 33
- 34 Mature leaves sericeous beneath ..... *N. lehmannii* (Meissner) Crisp
- 34\*Mature leaves glabrate ..... 35
- 35 Leaves cordate, 11-35 x 8-22 mm; calyces somewhat villous ..... *N. sp.* [*Dilkes*, PERTH 01052705]
- 35\*Leaves rounded at base, 6-22 x 4-14 mm; calyces sericeous ..... *N. pulchella* (Turcz.) Crisp
- 33\*Leaves either plicate or with apices manifestly recurved, usually both; outlines cuneate, spatulate or oblong-elliptic (the last with recurved, semi-pungent apices) ..... 36
- 36 Leaves rounded at base, oblong-elliptic to somewhat cuneate in outline, apices semi-pungent ..... *N. hookeri* (Meissner) Crisp
- 36\*Leaves with tapered or cuneate bases; outlines cuneate or spatulate; apices mucronate but not pungent ..... 37
- 37 Leaves spatulate, ternate ..... *N. spatulata* (Benth.) Crisp
- 37\*Leaves cuneate, decussate ..... *N. sp. A* (aff. *hookeri*)

### Notes on key

1. *Contra* Crisp & Weston (1987: 124), *Nemcia brownii* (Meissner) Crisp should be treated as *Gastrolobium brownii* Meissner. Its morphology is closer to *Gastrolobium*, and it contains fluoroacetate (T. Aplin, unpublished data; S. Patrick, pers. comm.).

2. Similarly, *N. truncata* (Benth.) Crisp proves on closer investigation to have the bracts, inflorescence and calyx of *Gastrolobium*, whence it came and to which it now should return, as *G. truncata* Benth. We do not know whether it has been tested for toxicity.

3. *N. pauciflora* is probably a taxonomic synonym of *N. plicata*, although this question needs more investigation.

4. *N. sp.* A aff. *hookeri* is variable and needs detailed study. It includes the types of *Gastrolobium stowardii* S. Moore, *G. spathulatum* Benth. var. *latifolium* Benth. and *G. tricuspdatum* Meissner var. *subinerme* Meissner, any of which may be distinct species.

### Acknowledgements

The second author made the only collection, the type, of *Nemcia effusa* while employed on contract by the Western Australian Department of Agriculture to survey remnant vegetation in the southern wheatbelt, a project funded by the Australian National Parks and Wildlife Service "Save the Bush" Program. F. Mollemans wishes to acknowledge the funding body.

### References

- Crisp, M.D. (in press). Evolution of bird-pollination in some Australian legumes (Fabaceae). In P. Eggleton & R. Vane-Wright (eds) "Phylogenetics and Ecology." (Academic Press: London.)
- Crisp, M.D. & Taylor, J.M. (1993). *Chorizema*. Australian Plants 17: 100-126.
- Crisp, M.D. & Weston, P.H. (1987). Cladistics and legume systematics, with an analysis of the Bossiaeeae, Brongniartieae and Mirbelieae. In C.H. Stirton (ed.) "Advances in Legumes Systematics, Part 3," pp. 65-130. (Royal Botanic Gardens: Kew.)
- Domin, K. (1923). *Nemcia*, a new genus of the Leguminosae. Preslia 2: 26-31.